TA 155 Mk. II Version

This version has the following improvements in relation to the TA 155 models.

Synchronous Masking: The masking attenuator is replaced by the masking distance control.

When this is turned from off to "Effective", the masking intensity will automatically follow the tone intensity and will normally just mask the tone.

In the positions +10 to +40dB, the masking level will be 10 to 40dB higher than the just effective masking.

Hood's test is therefore easily carried out by increasing the masking distance and checking if the threshold remains untouched.

Separate +20dB button: when pushed so that the button shows green, the intensity is increased by 20dB. This can also be used for speech, a facility not available on previous model.

The Speech Circuit has been improved so that the frequency curves also work for the external input, as well as for the microphone. The function switch now has positions for "Talk" and "Speech".

When the TA 155SM II is without speech circuit, the "Talk" position is mute and cannot be used. The external input is used as before, without tone control.

SMS II: When a speech circuit is built in, the Talk position connects the microphone and the Speech position the external input. In both cases the frequency curve control works.

If microphone and recorded speech are used, the microphone - in the Talk position - will of course be used for short instructions to the patient. This feature can also be utilised as a talk back circuit, the consultant using the monitor phone and the patient using the microphone.

(It should be noted that when the speech circuit is built in the sensivity of the ext. input is much higher, as without the circuit approximately 10 mVolt instead of approximately 500 mVolt are required).

INSTRUCTION MANUAL FOR TA 155

IMPORTANT. TAKE CARE OF YOUR HEADSET.

This audiometer has been calibrated with the headset earphones which are supplied with it. Care should be taken not to drop or damage the earphones as this will affect the accuracy of the unit.

Accessories available for use with the TA 155.

Mains unit 110/240 volts.
Insert masking earphone.
Monitor earphone for speech audiometry.
MD 611 microphone stand and lead.
4 frequency curves built into the speech circuit.

TO ENSURE CONTINUOUS ACCURACY, IT IS RECOMMENDED THAT YOUR TA 155 IS CALIBRATED AT LEAST ANNUALLY IN OUR LABORATORIES.

Further information on the TA 155 and other audiometers can be obtained from:

Kamplex Ltd.,
P.C.Werth Ltd.,
17, Stratford Place,
Oxford Street,
London,
W1N ODH.

Tel: 01-629 5559

Kamplex

CONTENTS PAGE

General Description of TA 155 Audiometer 1
Battery Replacement 1
Mains Operation 1
Optional Extras 2
Operation of the Controls 2
Function Switch 2
Masking Control 3
Output Selection Control . . . 3
Frequency Selector Control . . 3
Hearing Loss Control 4
Tone Interruptor Control . . . 4
Patient Signal Button 4
Instructions for Use 5
Air Conduction 5
Bone Conduction 6
Speech Audiometry 7
Free Field Testing 8

Kamplex

This manual should be read in conjunction with the front panel illustration inside back cover. This shows the positions and names of the various controls.

GENERAL DESCRIPTION

The Kamplex TA 155 is a portable/mains transistorized diagnostic audiometer for pure tone air and bone threshold measurement and speech audiometry.

Narrow band masking is employed via headphones or insert masking earphone to provide maximum resolution power and accuracy.

Speech testing can be performed monaurally and binaurally using live voice via microphone or recorded material via tape input socket. Facilities exist to allow attachment of a suitable loudspeaker for free field testing.

All accessories, including noise reducing headset if fitted, can be stored within the compartment provided for ease of portability and the whole unit is completely self-contained in a sturdy carrying case.

Battery Replacement. The TA 155 is powered by eight 1½ volt batteries (Ever Ready SP2, Mallory M13R, Vidor SP2 or equivalent). The battery pack is located on the left side of the accessory compartment with the batteries being accessible by removing the screw after disconnecting the plug. Battery condition is indicated by the VU meter with the audiometer switched on. If the needle fails to reach the battery section of the meter all batteries should be replaced.

For Mains Operation. A mains unit is available to operate on 110/240 volts. When provided, this is located in place of the battery pack and connected to the audiometer in the same way as the batteries.

The audiometer is supplied with:-

Double Moving Coil Headset
Bone Conductor with Lead and Connecting Plug
Patient Signal Button

Optional extras:-

Insert Masking Earphone.
Monitoring Earphone for Speech Testing.
External Loudspeaker with Amplifier.
Noise Excluding Headset.
Mains Unit 110/240 volts.
Microphone.

When a microphone is used the input is regulated by a control in the accessory compartment. The switch controlling the speech response curves when in-built is also located in the accessory compartment. The response slopes provided are:-

position 1 - a linear response
position 2 - 6dB per octave boost above 1,000 Hz.
position 3 - 12dB per octave boost above 1,000 Hz.
position 4 - 6dB per octave cut above 750 Hz.

N.B. A suitable tape recorder matching the impedance of the TA 155 can be recommended on request.

OPERATION OF THE CONTROLS.

REMEMBER TO SWITCH OFF WHEN NOT IN USE.

FUNCTION SWITCH. Position-MANUAL - signal interrupted when key depressed. Continuous signal when key locked in upward position.

Position-AUTOMATIC - pulsing signal at ¼ second intervals when key in up or down position.

Position-SPEECH - used for microphone or taped speech testing. For speech the VU meter acts as monitor with input regulated by appropriate control in accessory compartment.

Position-+20dB - extends intensity range by 20dB for frequency range 500-6,000 Hz for air

conduction only. Care should be taken to ensure that this position is not selected unless required.

MASKING CONTROL. The masking range is from 10-100dB. Narrow band masking calibrated to effective masking level is standard for pure tone testing. The masking automatically converts to white noise when the TA 155 is switched to speech. Masking is delivered through the opposite earphone to that selected for pure tone and will automatically change when ear selection is altered. For bone conduction, masking is emitted through red earphone only. It is advisable for maximum accuracy to mask by insert earphone for bone conduction threshold measurements. Use of insert earphone increases the inter-aural attenuation to 80/90dB. When insert masking earphone is plugged into the socket in the accessory compartment, the masking signal is automatically eliminated from the headset.

OUTPUT SELECTION CONTROL.

Position - LEFT (with blue spot) - signal to blue earphone.

Position - RIGHT (with red spot) - signal to red earphone.

Position - BONE - signal to bone oscillator.

Position - BINAUR - signal to both earphones.

Position - FF - signal to free field external connection.

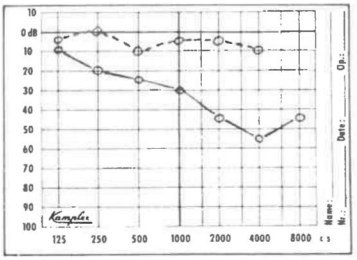
FREQUENCY SELECTOR CONTROL. Rotation of the right hand control knob selects the 11 pure tone frequencies. Each frequency appears in the dial aperture with the maximum intensities available for both air and bone conduction shown in the bottom aperture. It should be noted that selection of an intensity in excess of the maximum indicated will cause a decrease in the intensity of the signal. The maximum intensities for air conduction and bone conduction for each frequency are as follows:

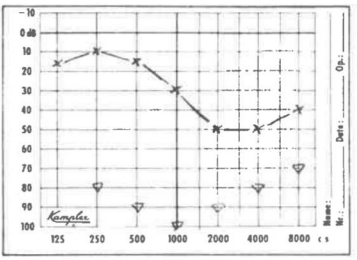
Frequency	Air		Bone
125	70		0
250	90		40
500	120		50
750	120		60
1000	120	using	60
1500	120	+20dB	60
2000	120	position	60
3000	120		60
4000	120		60
6000	120		0
8000	100		0

HEARING LOSS CONTROL. Rotation of the hearing loss control knob alters the pure tone intensity in 5dB steps over the range -10dB - 100dB. An extra 20dB can be added to this setting by the use of +20dB position on function control. Zero dB on the hearing loss control corresponds to the threshold of audibility for persons with average normal hearing.

TONE INTERRUPTOR CONTROL. Pressure sufficient only to cause movement of the VU meter needle is required to create signal. Excessive pressure should be avoided as undesirable. Care should be taken to return interruptor switch to mid (off) position when frequency is altered. The interruptor switch can be locked in the up position for continuous tone or use with pulsing signal.

RESPONSE. If the patient signal button is used to indicate that the tone is heard, pressure on the button will cause the response position to light up.





INSTRUCTIONS FOR USE

It is customary to record the thresholds of each ear in the form of an audiogram. The right ear threshold is normally denoted by the symbol "O" and the left ear by "X". Air conduction symbols are joined by an unbroken line and those for bone conduction by a broken line. Quiet conditions are conducive to accurate air conduction threshold measurement and for bone conduction they are almost essential. Where possible, use should be made of a sound treated room. Where this is not possible, it is advisable to have the audiometer fitted with noise reducing earcups. The subject should be comfortably seated and so positioned as to avoid observance of the audiometer controls. The accessory compartment lid may be left in the open position to further obscure the controls if desired.

Routine for air conduction threshold determination. Explain to the subject that a series of tones will be heard ranging from low pitched sounds to high pitched sounds and that the object of the test is to establish the quietest level at which tones can be heard. Ask the subject to indicate each time a tone is heard. The indication can be by use of the patient signal button provided, raising a hand or finger, or a "Yes" response. Fit the red coloured earphones to the right ear and the blue to the left adjusting the sliding headband to ensure that the earphone apertures are directly opposite the ear canals. Errors may occur if this procedure is not followed. Set output switch to the ear intended for testing first. It is advisable to start the test on a known better ear. Set frequency dial to 1,000 Hz and the hearing loss control to 50-60dB or if threshold is known some 10-20dB in excess of this to facilitate identification.

Depress tone interruptor for 1/2 seconds. Signals longer than this should be avoided. If the tone is not heard the intensity range should be increased in 10dB steps until the subject responds, always interrupting the tone whilst adjusting the hearing loss control. Having obtained a response the intensity is reduced in 5dB steps until the subject fails to respond. Raise the intensity by 5dB to re-check the threshold and mark the audiogram accordingly. Repeat the procedure at 1500 Hz and at each higher frequency. Then proceed to the frequencies below 1,000 Hz, finishing the procedure on that ear by re-checking the original threshold at 1,000 Hz. Repeat the same procedure for the opposite ear.

Where a difference of 40dB exists between the thresholds of the two ears, these thresholds should be verified by the application of masking to the untested ear. Masking will automatically emit from the opposite earphone to that set for testing the pure tone. As the masking generator is calibrated to effective masking level, the pure tone threshold of the untested ear will be masked by a similar level of masking signal. With masking applied, check the original measurement. Increase the masking level in 10dB steps until the pure tone threshold is unaffected by further increases in masking intensity.

N.B. A pulsing tone may be used to facilitate signal identification should the subject suffer with severe tinnitus (head noises). It can also be usefully employed as a conditioning stimulus to indicate to the subject the type of signal to be expected. Pulsing is obtained by setting function switch to automatic.

Bone Conduction Threshold Measurements. Correct siting of the oscillator is important to accurate bone conduction measurement. The oscillator should be located on the most sensitive contact point of the mastoid which is obtained by the use of 1,000 Hz continuous signal some 20dB above threshold whilst probing the area. The oscillator should be left in this position during the entire test on that ear.

Masking should be used for all bone conduction measurements. The TA 155 allows the masking to be applied via insert earphone thus reducing the contact area on the skull and increasing the inter-aural attenuation to 80-90dB. If the masking is applied by a headset the red earphone only will be activated. Care should be taken to avoid occlusion of the ear under test. Firstly check the bone conduction threshold without masking utilizing a similar technique to that described for air conduction testing. Switch on masking and set the level as described in the air conduction test. Establish the pure tone threshold. The masking should then be increased by 10dB and the pure tone threshold re-checked. Continue this procedure until an increase in masking intensity fails to affect the pure tone threshold. Repeat this procedure for each higher frequency and then the frequency below 1,000 Hz. Join the symbols on the audiogram with a broken line and repeat the procedure for the opposite ear.

Speech Audiometry. Live voice. The microphone is plugged into the appropriate socket in the accessory compartment and the function switch set to "Speech". The voice input is regulated using the input control inside the accessory compartment and adjusting so that the loudest passages of speech cause the needle on the VU meter to fluctuate around zero. The intensity received at the ear is then adjusted in the normal way by means of the hearing loss control ~~which is calibrated to relate to Spondee threshold (i.e. 19dB above zero at 1,000 Hz)~~. The maximum intensity for speech is 100dB. Monaural and binaural tests may be performed by use of the output selector switch. Where the TA 155 is provided with variable response curves, use can be made of these to assist in the selection of optimum hearing aid responses.

Recorded Material. A conventional tape recorder can be connected to the external input socket of the audiometer. Speech tapes provide a calibrating 1,000 Hz signal at the beginning which is used to adjust the input level. Adjust the tape recorder volume control until the VU meter needle zeros. The word lists used will then relate to Spondee threshold. A monitor earphone can be used to follow the

subject's response for which a separate gain control is provided.

Free Field Testing. An output position is provided to attach a suitable loudspeaker, the use of which requires the selection of the FF position on the output control. In order to obtain satisfactory output from the speaker, it should either be provided with an inbuilt amplifier or a pre-amp should be used. The output level from the loudspeaker is measured by use of a Sound Level Meter.

Notes